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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/469,308	12/22/1999	IK PYO HONG	K-150	4822

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THE LAW OFFICES OF FLESHNER AND KIM
P O BOX 221200
CHANTILLY, VA 201531200

EXAMINER	
FAHMY, SHERIF R	
ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 09/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/469,308	HONG, IK PYO	
	Examiner	Art Unit	
	Sherif R. Fahmy	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) *4 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 December 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/469,308* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Claim Objections

1. Claims 4 and 8 are objected to because of the following informalities: these claims are not in the form of a coherent sentence; "wherein" must be followed by a statement including a subject and a predicate. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo in vew of Fillot.

Regarding claim 1, Okubo teaches a fiber-optic repeating system (abstract, figure 1), consisting of a master repeater (3 in figure 1), a slave repeater (4 in figure 1) and optical fibers connecting the master repeater to the slave repeater (5 in figure 1 and column 1- lines 61-64). The master repeater processes an RF signal, and transmits it to the slave repeater through the optical fiber (column 1, lines 42-47). Okubo teaches a method for gain control of the fiber-optic repeating system (Column 7- lines 12-18, and column 6, lines 49-50), the method comprising comparing the level of a signal transmitted from the master repeater to a predetermined level in the slave repeater, obtaining a difference, and controlling the gain of an amplifier for the RF signal in the slave repeater based on the difference (45 and 46 in figure 1, column- lines 12-18).

Okubo does not teach mixing a modulated modem signal of a predetermined level with the RF signal in the master repeater, detecting the modulated modem signal in the slave repeater and comparing its level in the slave repeater with said predetermined level to obtain said difference.

Fillot teaches detecting a modulated modem signal (pilot signal) in a repeater circuit, one of the intermediate amplification circuits mentioned in the abstract, using a bandpass filter (column 3, lines 46-48); accordingly, the signal inherently had been mixed with another transmitted signal, so as to require extraction using a bandpass filter. Fillot also explicitly teaches mixing of pilot signals transmitted to fiber-optic repeaters (column 7, lines 35-38) with a data signal (column 7, lines 24-28, and column 8- lines 7-12). The pilot signal is compared to a predetermined level, and the obtained difference is used to vary the gain of the repeater's amplifier (column 3, lines 46-53). It would have been obvious to one having ordinary skill in the art, at the time the present invention was made to mix Fillot's pilot signal with the RF signal in Okubo's master repeater, to transmit it to the slave repeater of Okubo, to detect it in the slave repeater and to compare the level of the pilot signal with a predetermined value, using the obtained difference to vary the amplifier gain in the slave repeater. One of ordinary skill in the art would have been motivated to do this in order to adjust the amplifier's gain based on the attenuation due to the fiber medium, if this attenuation is all that needs to be taken into account for adjusting the gain, since it is well known in the art that the initial RF signal may vary significantly in level aside from variations due to subsequent attenuation in the fiber medium, whereas a pilot signal is generated at a constant level.

4. Regarding claim 2, Fillot teaches that the modulated modem signal is detected in a controller of the slave repeater (column 1, lines 46-48).

5. Regarding claim 3, Okubo further teaches a base station in communication with the master repeater (1 in figure 4). Accordingly, the modified device of Okubo and Fillot, forming the basis for the rejection of claim 1 above, may further comprise a base station in communication with the master repeater.

Fillot also teaches controlling the gain of the amplifier in the slave repeaters by a direct control signal from a monitoring station, and not by comparing the level of the pilot signal with a predetermined level (column 10- lines 49-57). As shown hereinabove, Fillot describes at least a repeater that compares a pilot signal with a predetermined value to set the gain of an amplifier (see rejection of claim 1), and a repeater that sets the gain according to direct instructions from a monitoring unit (column 10- lines 49-57). It is well known in the art that a repeater according to Fillot may be easily constructed with the capability to perform at least both of these tasks (one at a time), and may be easily configured to perform one particular task always unless instructed to perform another task, for instance by using interrupt-handling in the repeater circuitry. It would have been obvious to one having ordinary skill in the art at the time the present invention was made to control the repeater of the modified system of Okubo and Fillot described in the rejection of claim 1, and further comprising a base station, with a circuit that compares the pilot signal with the predetermined level unless the master repeater transmits a control signal from the base station to the slave repeater. One of ordinary skill in the art would have been motivated to do this in order to adjust the gain in the slave repeaters to account for changes at the transmission end (the base station and master repeater), such as a weakened or intensified RF signal transmitted to the master repeater from the base station due to changes in weather conditions.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo and Fillot as applied to claim 1 above, and further in view of Kobayashi et al. The modified system of Okubo and Fillot, forming the basis for the rejection of claim 1 above includes using the difference arising out of the comparison to modify the gain of the amplifier (Fillot, column 3- lines 46-53). The system does not specify increasing the level of the RF signal by the obtained difference. Kobayashi teaches a communication system comprising a plurality of modems connected to a transmission line, where a head end sends a pilot signal to the modems and each modem compares the signal level thereof to a predetermined value, obtains the difference and increases its amplification gain to increase the RF level by the obtained difference (column 5- line 21 to column 6- line 13, including equations). It would have been obvious to one having ordinary skill in the art at the time the present invention was made to increase the RF level by said difference, in the modified system of Okubo and Fillot that formed the basis for the rejection of claim 1. One of ordinary skill in the art would have been motivated to do so if a certain minimum RF level is desired to be transmitted from the slave repeater's antenna to whatever terminal station.

7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo in vew of Fillot.

Regarding claim 5, Okubo teaches a fiber-optic repeating system (abstract, figure 1) and method comprising transmitting from a base station (1 in figure 4) a first RF signal (figure 4, arrow pointing from base station to the master device 3), amplifying the first RF signal by a constant level through an amplifier of a master repeater (figure 1- constant gain amplifier shown between the duplexer in 31 and E/O stage 32 of master repeater 3), the system also comprising a

slave repeater (4 in figure 1) and optical fibers connecting the master repeater to the slave repeater (5 in figure 1 and column 1- lines 61-64). According to Okubo's method, the master repeater transmits the first amplified RF signal to the slave repeater through the optical fiber (column 1, lines 42-47). Okubo teaches detecting a second RF signal in the slave repeater (see 42 in figure 2). Okubo also teaches comparing a detected signal level of a signal transmitted from the master repeater to a predetermined level in the slave repeater, obtaining a difference, and controlling the gain of an amplifier for the RF signal in the slave repeater based on the difference (45 and 46 in figure 1, column- lines 12-18). Okubo also teaches amplifying the second RF signal according to the controlled gain (46 in figure 2), and transmitting the amplified second RF signal to a terminal (see arrow pointing away from the antenna of slave device 6-1 in figure 4, and column 1- lines 15-17). Okubo does not teach mixing a modulated modem signal of a predetermined level with the first RF signal in the master repeater, separating the mixed signal in the slave repeater into a second modulated modem signal and a second RF signal, detecting the level of the second modulated modem signal, and comparing its level in the slave repeater with said predetermined level to obtain said difference.

Fillot teaches detecting a modulated modem signal (pilot signal) in one of multiple repeater circuits, the intermediate amplification circuits mentioned in the abstract, using a bandpass filter (column 3, lines 46-48); accordingly, the signal inherently had been mixed with another transmitted signal, so as to require extraction using a bandpass filter. Fillot also explicitly teaches mixing of pilot signals transmitted to fiber-optic repeaters (column 7, lines 35-38) with a data signal (column 7, lines 24-28, and column 8- lines 7-12). The pilot signal is compared to a predetermined level, and the obtained difference is used to vary the gain of the repeater's

amplifier (column 3, lines 46-53). It would have been obvious to one having ordinary skill in the art, at the time the present invention was made to mix Fillot's pilot signal with the RF signal in Okubo's master repeater, to transmit it to the slave repeater of Okubo, to separate the pilot signal from the RF data signal, into a second pilot signal, to detect its level in the slave repeater and to compare the level of the second pilot signal with a predetermined value, using the obtained difference to vary the amplifier gain in the slave repeater, in order to amplify the second RF signal to be transmitted. One of ordinary skill in the art would have been motivated to do this in order to adjust the amplifier's gain based on the attenuation due to the fiber medium, if this attenuation is all that needs to be taken into account for adjusting the gain, since it is well known in the art that the initial RF signal may vary significantly in level aside from variations due to subsequent attenuation in the fiber medium, whereas a pilot signal is generated at a constant level.

8. Regarding claim 6, Fillot teaches that the modulated modem signal is detected in a controller of the slave repeater (column 1, lines 46-48).

9. Regarding claim 7, Okubo further teaches a base station in communication with the master repeater (1 in figure 4). Accordingly, the modified system of Okubo and Fillot, forming the basis for the rejection of claim 5 above, may further comprise a base station in communication with the master repeater.

Fillot also teaches controlling the gain of the amplifier in the slave repeaters by a direct control signal from a monitoring station, and not by comparing the level of the pilot signal with a predetermined level (column 10- lines 49-57). As shown hereinabove, Fillot describes at least a repeater that compares a pilot signal with a predetermined value to set the gain of an amplifier

(see rejection of claim 5), and a repeater that sets the gain according to direct instructions from a monitoring unit (column 10- lines 49-57). It is well known in the art that a repeater according to Fillot may be easily constructed with the capability of performing at least both of these tasks (one at a time), and may be easily configured to perform one particular task always unless instructed to perform another task, for instance by using interrupt-handling in the repeater circuitry. It would have been obvious to one having ordinary skill in the art at the time the invention was made to control the repeater of the modified system of Okubo and Fillot, described in the rejection of claim 5 and further comprising a base station, with a circuit that compares the pilot signal with the predetermined level, unless the master repeater transmits a control signal from the base station to the slave repeater. One of ordinary skill in the art would have been motivated to do this in order to adjust the gain in the slave repeaters to account for changes at the transmission end (the base station and master repeater), such as a weakened or intensified RF signal transmitted to the master repeater from the base station due to changes in weather conditions.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo and Fillot as applied to claim 5 above, and further in view of Kobayashi et al. The modified system of Okubo and Fillot, forming the basis for the rejection of claim 1 above includes using the difference arising out of the comparison to modify the gain of the amplifier (Fillot, column 3- lines 46-53). The system does not specify increasing the level of the RF signal by the obtained difference. Kobayashi teaches a communication system comprising a plurality of modems connected to a transmission line, where a head end sends a pilot signal to the modems and each modem compares the signal level thereof to a predetermined value, obtains the difference and

increases the amplification gain to increase the RF level by the obtained difference (column 5- line 21 to column 6- line 13, including equations). It would have been obvious to one having ordinary skill in the art at the time the present invention was made to increase the RF level by said difference. One of ordinary skill in the art would have been motivated to do so if a certain RF level is desired to be transmitted from the slave repeater's antenna to whatever terminal station.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Imajo is cited for disclosing an optical fiber-based RF repeater system having a base station, a master repeater, slave repeaters and terminal devices. Ishimura et al is cited for disclosing a fiber-optic repeater having gain control and management signal mixed with the data signal. Cook et al is cited for disclosing a repeater system for RF communication having a control signal mixed with the data signal. Boutmy et al, Brewer, Märkl, Franco et al, Pavritz et al, Takagi et al, Nakama et al, Epworth, and Fishman are cited for disclosing methods for monitoring and adjusting remote repeaters in a transmission system.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherif R. Fahmy whose telephone number is 703-305-8088. The examiner can normally be reached on 8:30AM-6:00PM(Mo-Th) 8:30AM-5:00PM(2nd & 4th Fr).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3988 for regular communications and 703-305-3988 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

SRF
September 7, 2002

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600